NYASALAND PROTECTORATE

Annual Medical Report

ON THE

HEALTH AND SANITARY CONDITION

OF THE

NYASALAND PROTECTORATE

FOR THE

YEAR ENDED 31st DECEMBER, 1919.

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Office of the Principal Medical Officer,

Zomba,

Nyasaland Protectorate.

5th October, 1920.

Sir,

I have the honour to submit for the information of His Excellency the Governor, and for transmission to the Right Honourable the Secretary of State, the Medical Report on the Health and Sanitary Condition of the Nyasaland Protectorate for the year 1919, together with the Returns, etc, appended thereto.

I have the honour to be,

Sir,

Your obedient servant,

A. G. ELDRED,

Acting Principal Medical Officer.

Nyasaland Protectorate.

To

The Hon'ble the Acting Chief Secretary,

Zomba.

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NYASALAND PROTECTORATE.

ANNUAL MEDICAL REPORT

FOR THE YEAR ENDED THE 31st DECEMBER, 1919.

I. ADMINISTRATIVE.

STAFF.

The Medical Staff consisted of:—
The Principal Medical Officer.
3 Medical Officers and 2 on leave (6 vacancies).

Fortunately the services of two Medical Officers, seconded from the West African Medical Service, were available, making a total of 5 Medical Officers in the Protectorate.

The Nursing Staff comprised:—
The Matron.
3 Nursing Sisters. (1 vacancy).

P.M.O.s Office:—One Clerk.

Subordinate Staff:—1 Second Class Senior Sub-Assistant Surgeon.
2 First Class Sub-Assistant Surgeons.

Of these only one was on civil duty.

Principal Appointments and Changes during the Year.

New Appointments:—Dr. W. Milne-Tough was appointed to the Medical Staff on 19th May, 1919, and assumed duty in the Protectorate on 31st May, 1919.
Nursing Sister Walbrugh was appointed to the nursing staff on 1st January, 1919, and assumed duty as civil Nursing Sister on 1st January, 1919.

Leave:—Dr. G. M. Sanderson proceeded on leave on 19th February, 1919.
Dr. J. B. Davey proceeded on leave on 27th May, 1919.
Dr. A. G. Eldred proceeded on leave on 17th June, 1919.
Miss S. M. Symonds proceeded on leave on 22nd October, 1919.
Dr. R. Bury returned from leave 9th August, 1919.
Dr. G. M. Sanderson returned from leave 16th November, 1919.

Transfers:—Dr. J. B. Davey was appointed as Principal Medical Officers Dar-es-Salaam.
Dr. W. A. Lamborn was transferred to the Federated Malay State, in December, 1919, after having been only a few months in this country.

Invalidings:—Dr. M. G. Sanderson was invalided to England in February, 1919.
Senior Sub-Assistant Surgeon Bir Singh was invalided to India in March, 1919.

Deaths:—Nil.

Disposition of the Medical Staff in 1919.

A. Medical Staff.

Zomba.—Dr. H. Hearsey, O.B.E., P.M.O.
Dr. J. E. S. Old, Medical Officer from January to May.
Dr. W. Milne-Tough, from July to December.

Blantyre.—Dr. J. B. Davey, January to May.
Dr. J. E. S. Old, May to December.

Port Herald.—Dr. A. G. Eldred, January to June.
Dr. H. E. Arbuckle, (W.A.M.S.) July to December.

Fort Johnston.—Dr. E. J. Quirk, (W.A.M.S.) March to December.

Karonga.—Dr. H. E. Arbuckle, (W.A.M.S.) from January to June
Dr. W. A. Lamborn from September to December.
} and on special plague duty.

Mlanje.—No Medical Officer was available for duty at this station.

Kota Kota.— Do.

Chinteche.— Do.

Sleeping Sickness.—Owing to shortage of staff no Medical Officer was available for duty in connection with Sleeping Sickness investigation.

B. Nursing Staff.

Zomba.—Miss A. A. Pallot, from May to December.
Miss S. M. Symonds from January to October.

Blantyre.—Miss R. Paterson, Matron, from January to December.
Miss F. A. Walbrugh, from January to December.

C. Sub-Assistant Surgeons.

Zomba.—S.A.S. Varyam Singh, from January to March, proceeded on leave.
S.A.S. Kishan Singh from March to December.

Fort Johnston.—S.A.S. Kishan Singh from January to March (military duty).

Limbe.—S.S.A.S. Bir Singh, from January to March (military duty), was invalided.

TABLE I. MEDICAL STAFF.

Principal Medical Officer. H. Hearsey.

Medical Officers.

J. E. S. Old.
J. B. Davey (proceeded on leave May).
A. G. Eldred (proceeded on leave June).
G. M. Sanderson (proceeded on leave February).
R. Bury, (returned from leave August).
W. Milne-Tough (appointed in May).
W. A. Lamborn (transferred to F.M.S.).
H. E. Arbuckle (temporary seconded from W.A.M.S.).
E. J. Quirk (temporary seconded from W.A.M.S.).

Nursing Staff.

Matron :—R. Paterson.

Nursing Sisters.

A. A. Pallot. S. M. Symonds.
F. A. Walbrugh.

Sub-Assistant Surgeons.

Senior S. A. S. Bir. Singh. S. A. S. Varyam Singh.
S. A. S. Kishan Singh.

It will be seen that at no time during the year were there more than 5 Medical Officers in the whole country, that only 3 of these were Nyasaland Medical Officers and the available medical staff has never, during the whole year, been up to 60% of full strength.

FINANCIAL RETURN 1919-20.

The estimated expenditure of the Medical Department was as follows:—

Personal Emoluments	£8,466
Other Charges	2,364
	£10,830

The actual expenditure was

Personal Emoluments	£12,066-19-2
Other Charges	£4,679-11-4
	£16,746-10-6

The over expenditure was incurred mainly on account of

(i) Personal emoluments, i.e., war bonuses, current and retrospective.

(ii) Other charges. Travelling (increased rates for W.A.M.S.)
Passages. Influenza. Plague (rat-payments).

Revenue—This was £356-12s. from Hospital fees.

II. PUBLIC HEALTH.

(A.)

Owing to the extreme shortage of the Medical Staff, it has been impossible to carry out any serious investigations in connection with communicable diseases in general and statistics, especially as far as natives are concerned, will obviously be of little value, owing to the small number involved, out of a population of some one and a quarter million natives.

1. GENERAL DISEASES.

There has been nothing of special note to report with regard to non-communicable diseases.

2. COMMUNICABLE DISEASES.

(1) Mosquito or Insect-Borne.

Malaria.—There is nothing of special note to be recorded.

The Sub-tertian is the parasite usually found in both European and native infections, the tertian less commonly, and the quartan is hardly ever recorded.

It is no unusual experience to find native children in apparently good health, and with normal temperatures, with the peripheral blood full of parasites in all stages, including sporulating forms (with 8-10 spores) and crescents, and these sporulating forms are probably instances of the sub-tertian parasites completing their cycle in the peripheral blood.

Blackwater Fever.—There have been six cases of this disease recorded by Medical Officers during the year, with one death; there was nothing noteworthy as regards seasonal variation. A history of previous attacks of malaria was given in all the cases.

It is possible that some of the mild and transient attacks that are reported and have not been seen by a doctor are not true 'Blackwater fevers' but cases of either malarial haemoglobinuria, or so-called quinine haemoglobinuria, though as regards this latter disease, a true 'blackwater fever' case has frequently taken a large dose of quinine just prior to the onset of the blackwater attack, and as a result of this there is a popular idea that quinine causes 'blackwater fever.'

Filariasis.—The existence of this disease and its incidence, &c, has been mentioned in previous reports; it has not been possible to carry out any further investigation recently.

Culex fatigans, Mansonia uniformis, and Pyretopherus costalis are generally distributed.

Trypanosomiasis.—Owing to shortage of Medical Officers it was impossible to detail any Medical Officer for special duty in connection with the disease.

In September, 1919, Dr. Lamborn made a journey in the Marimba District and submitted the report shewn in appendix.

It is a matter for regret that this country has lost the services of so valuable a worker.

A case of trypanosomiasis was admitted to Fort Johnston hospital from Dowa, in August, 1919.

History as follows:—

"The history is a 3 months' illness, fever and muscular pains, on admission he was very weak and anaemic, liver and spleen enlarged, neuritis of legs, on 13th August a blood film was negative but stools showed a heavy ankylostome infection, he has gradually become more drowsy, and to day five trypanosomes were seen in a thick blood film. There is no glandular enlargement."

As in other diseases, the number of cases of trypanosomiasis recorded will depend on the facilities for investigation, but it is quite evident that there can be no marked spread of the disease, if indeed it is spreading at all, as evidence of this would be forthcoming.

Plague.—With the exception of an interval of a few weeks, a Medical Officer has been continuously stationed in the North Nyasa district, continuing prophylactic measures, and investigating all suspicious cases of illness or deaths.

The only recorded cases of plague in 1919 occurred in August, and though some suspected cases were reported in September, these proved on investigation not to have been plague.

And in December, 1919, it was discovered, through non-payment of hut taxes, that 7 deaths had occurred, after a short illness, about the same time, but there is no evidence to prove that these were cases of plague.

The statistics in regard to plague in North Nyasa, and in the Luangwa Valley outbreak, shew that the infection reaches its height in the rainy season, and in India an excessive rainfall has been found to favour the spread of the disease. It is therefore a matter for congratulation that no cases at all have occurred from August, 1919, up to the time of compiling this report (May, 1920), *i.e.* through the whole of a rainy season.

The following shews the total number of cases recorded since 1916 :—

1916	1917	1918		1919
13	28	5	(2 returned as "suspect")	3

During the year preventive measures were continuously adopted, the total of rats killed up to December 31st, 1919, was as under :—

April	... 8,109
May	... 37,504
June	314,276
August	... 36,912
September	608,181
October	... 41,740
November	... 95,842
December	109,404
Totals	1,247,068

The whole district has been periodically visited by the Medical Officer and it is unlikely that many, if any, cases of plague would have escaped observation.

Tick Fever.—The districts in which this disease is most prevalent are those in which it has recently been impossible to station Medical Officers, consequently the returns of tick fever are practically nil, but there is no reason to suppose that it is not just as prevalent as in the past, and the accounts given by Residents of sickness among natives in infected areas, point to the occurrence of cases of tick fever.

Cases treated.

	1919	1918
Malaria	299	307
Blackwater	6	1
Trypanosomiasis ...	1	...
Tick Fever	... ...	...
Plague	3	5

2. INFECTIOUS OR EPIDEMIC.

Here again, with a depleted staff, it is very little use quoting statistics of such diseases as beri beri, dysentery, yaws, syphilis, leprosy, pneumonia, &c. All these diseases exist in an endemic form, but there has been nothing in the nature of an epidemic, and no return of pellagra among the inmates of the central prison, nor have there been any further cases of cerebro-spinal meningitis.

It will only be when we have a full staff of Medical Officers, and a sufficient number of native hospitals in the outlying districts, that we can hope to make any effort to really deal with diseases among the natives.

Cases treated.

	1919	1918
Beri beri	...	3
Chicken-pox	18	15
Dysentery	277	398
Enteric	4	3
Erysipelas	4	...
Gonorrhoea	98	35
Leprosy	4	6
Measles	2	14
Pneumonia	48	53
Syphilis	205	103
Tuberculosis	24	9
Whooping cough ...	5	20
Yaws	13	39
Pellagra	1	2

B. EUROPEAN OFFICIALS.

Medically boarded and invalided.	1919.	1918.	1917.
	20	15	11

Causes of invaliding.

1. Anaemia and debility as a result of dysentery (bacillary) and prolonged residence in the tropics.
2. General debility.
3. General debility.
4. Pleurisy.
5. Empyema.
6. Gastritis, tachycardia.
7. Neurasthenia.
8. Acute nephritis.
9. Tachycardia.
10. Nervous exhaustion.
11. Malaria and anaemia.
12. Signs of slight renal disease ; also external haemorrhoids.
13. Severe infection of Lamblia intestinalis.
14. Insomnia, neurasthenia and anaemia.
15. Valvular disease of the heart due to acute rheumatism.
19. Paranoia.
17. Malarial debility.
18. Renal calculus.
19. Incipient pulmonary phthisis.
20. General debility ; recent attacks of enteric, relapsing, and malarial fevers.

There is no doubt that this high rate of invaliding was to a great extent due to the long tours of service performed in many cases. Of the above, 7 had completed 5 to 6 years or more, and 6 had done 3 to 4 years, and an inspection of the Medical Certificates of other officials who proceeded home on ordinary leave without Medical Board shows that their health had suffered from the long tours of service they had performed.

170 Officials came under treatment, the principal diseases in order of frequency being, malaria, gastro-intestinal disorders, bronchitis, and debility.

There were no deaths.

TABLE SHOWING SICK, INVALIDING AND DEATH RATES FOR EUROPEAN OFFICIALS

	1919
Total number of Officials	137
Average number resident	83
Total number on Sick List	165
Total number of days on Sick List	1585
Average daily number on Sick List	0·21
Percentage of Sick to average number resident	121·9
Average number of days on Sick List for each Patient	8·69
Average Sick time to each resident	9·87
Total number Invalided	20
Percentage of Invalidings to total residents	14·6
Total Deaths	Nil
Percentage of Deaths to total residents	„
„ „ „ „ average number resident	„
No. of cases of Sickness contracted away from residence	„

The above returns are for the four stations at which a medical official is always resident, Zomba, Blantyre, Fort Johnston and Port Herald.

In the absence of Medical Officers in nearly all other stations and districts, it is impossible to give figures.

The only totals for the whole colony are number of officials and invalidings.

C. GENERAL EUROPEAN POPULATION.

A total of 313 non-officials came under treatment during the year with 7 deaths.

The European population has increased nearly 100% in the last 2 years, and in many districts now occupied by Europeans there is no doctor available and probably many cases of unrecorded sickness occur. The principal diseases recorded, in order of frequency were as follows :—

Malaria, gastro intestinal disorders, and injuries. The deaths were due to paratyphoid, blackwater, pneumonia, and heart disease.

III. SANITATION.

There is no Sanitary Department, but it is hoped that one may be established in the future.

1. ADMINISTRATIVE.

1. Epidemic and Contagious Diseases Rules of 1918 were applied to North Nyasa and Mombera Districts, in respect of plague, on March 21st, 1919.

2. Same Rules applied to whole Protectorate in respect of small-pox on August 8th, 1919.

2. PREVENTIVE MEASURES.

In the absence of a Sanitary Department, it is not possible to do much in the way of organized prophylaxis on a large scale against such diseases as malaria, &c.

Sanitary matters in Townships are under the control of Town Councils, and such a system has never in my experience been found satisfactory in the tropics.

Malaria.—As regards malaria, an effort is being made in the right direction in removing police lines, prisons and the native quarters from close proximity to European dwellings, and in building two storey houses, and efficiently screening them, and, though much remains to be done, ultimately conditions should be decidedly better, but there is no doubt that the efficient control of sanitary matters in the tropics is best maintained by a Sanitary Department working in conjunction with a Sanitary Engineering Branch of the Public Works Department.

Small-pox.—Results with imported lymph are not all that could be desired, and next year the manufacture of a locally prepared lymph is to be commenced.

It is however impossible to expect really good results whatever lymph is used, until our staff of Medical Officers is large enough to permit regular and frequent inspections of districts and of vaccinators.

A return of vaccinations during the year is appended:—

District.	Successful.	Modified.	Failed.	Not seen.	Total.
Port Herald	8,527	3,340	2,409	1,235	15,511
Ruo	4,496	755	243	142	5,636
Mlanje	3,219	2,480	1,526	1,082	8,307
West Shire	487	717	906	42	2,152
Blantyre	20,463	7,157	1,920	373	29,913
Zomba	8,166	2,585	2,369	920	14,040
Upper Shire	3,716	1,206	973	142	6,037
South Nyasa	967	416	480	270	2,133
Dedza	466	371	356	290	1,483
Lilongwe	2,095	1,712	1,811	1,718	7,336
Dowa	120	213	448	34	815
Marimba	3,206	2,513	2,136	—	7,855
West Nyasa	2,978	2,309	2,763	2,083	10,133
Mzimba	9,146	1,259	1,139	1,556	13,100
North Nyasa	252	203	351	—	806
Total	68,304	27,236	19,830	9,887	125,257

Small-pox has been endemic in various centres, but there has been no outbreak of marked severity.

There is in my opinion no doubt that a proportion, in some instances a fairly large proportion of the cases, are not actually small-pox but an allied disease known variously as alastrim, kaffir milk-pox, &c, but investigation must wait until we have a sufficient staff.

3. GENERAL MEASURES.

Port Herald.—The Medical Officer, in his annual report, draws attention to the situation of the Township, which renders mosquito control impossible, the opposite bank of the river being in Portuguese territory.

Even if this area was under our control, it is doubtful if one could do much, for it consists of thousands of acres of very low lying marshy land, and though the Township itself is kept absolutely clear of undergrowth and potential mosquito breeding areas, mosquitoes still remain abundant, and there is little doubt that the modern estimates of the distance mosquitoes can travel will require considerable revision in the future.

Fort Johnston.—The Medical Officer reports that, owing to the small number of ratepayers, the funds at the disposal of the Town Council are not sufficient to carry out the work (clearance of grass and undergrowth, draining, &c) as often and thoroughly as is desirable.

Here also one is confronted with the difficulty of a Township situated on the banks of a shallow sluggish river, with adjacent marshy land, and a most costly scheme of redraining and embankment work would be necessary.

It would however be very little use undertaking this, in view of the probable removal of the Township to another site.

The best action that can be taken in all such cases would appear to be the building of the two storey type of house with efficient protection from mosquitoes, and the removal of native quarters from close proximity to Europeans. All future townships should be planned on such lines.

Zomba.—The situation of this town increases the difficulties of mosquito control.

As regards European conservancy the same methods obtain as in the past, each householder supervises his own sanitary arrangements. As regards natives there are a certain number of public latrines, and a gang of labourers are employed for the collection, &c, of pans. Rubbish is collected, and burnt when the weather permits, and otherwise buried, and excreta are buried.

In the absence of an efficiently controlled sanitary gang this is probably the most satisfactory method, as it would be useless to expect individual native labourers to carry all waste material to some one selected site; they would simply dispose of their load in the first convenient patch of grass.

But the fact remains that a Sanitary Department is daily becoming more necessary in this country, with its rapidly increasing European population.

Several schemes have been suggested in the past, but for one reason or another discarded: the fact that a sanitation scheme can hardly be a financial success in small tropical townships is one of the difficulties.

From the Annual Report of 1913 (p.21) it would appear that a suitable scheme had been suggested and reported on.

The scheme is a simple and effective one, and has been in satisfactory operation in many tropical towns for years past.

Apart from the initial cost of material, and this would not be very much, as very little is necessary except destructors of a simple type, small covered handcarts, and an increase in the number of latrine and refuse pans, the annual cost of a sanitary organization in Zomba should not exceed £500-£600, including a mosquito brigade, and a proportion of this amount could be borne by instituting a sanitary rate. Until such an organization is in being it will be impossible for a whole time Medical Officer of Health to make much progress in sanitary improvements.

As regards the native, his education is entirely under the control of the various missions and any knowledge he may have of hygiene or sanitation is derived from mission schools, but he does not shew any evidence of its practical application.

TABLE IV.

SUMMARY OF ROUTINE SANITARY WORK DONE DURING THE YEAR IN THE TOWN.

1. Name of Town—Port Herald.

—	Approximate area.	Number of proclaimed open spaces.
1917	200 acres.	Nil.
1918	200 „	„
1919	200 „	„

2. Population.

—	Number of Asiatics.		Number of Europeans.		Total.
	Males.	Females.	Males.	Females.	
1917	243	46	12	3	394
1918 ... Asiatics.	33	12	7	1	53
1919 ...	29	10	7	1	46

3. Housing.

—	Number occupied by Europeans.	Number occupied by Asiatics.
Number of Houses :—		
1917	10	92 (brick).
1918	7	17
1919	7	19
Number of Huts :—		
1917	—	9
1918	Nil.	Nil.
1919	„	„

4. Mosquito Protection of Houses.

—	1917	1918	1919
Number of European houses wholly mosquito-protected ...	3	3	4
Number of European houses with mosquito room	6	6	5
Number rendered during the year wholly mosquito-protected	—	—	—
Number rendered during the year partially mosquito-protected	—	—	—

5. Erection of New Buildings during the Year.

——	1917	1918	1919
Number of public buildings erected with sanction as to site, construction, and relation to other buildings	—	—	—
Number of houses erected with sanction as to site, construction, and relation to other buildings	2	—	1
Number of huts erected with sanction as to site, construction, and relation to other buildings	5	—	—
Number of houses built without sanction			
Number of huts built without sanction	—	—	—

Action Taken.

——	Number of Prosecutions		Number demolished.	
	Huts.	Houses.	Huts.	Houses.
1917	—	—	5	2
1918	—	—	—	—
1919	—	—	—	—

6. Markets.

——	Total number.	Number paved and drained.	Number unpaved.
1917	—	—	—
1918	1	—	—
1919	1	1	—

7. Slaughter-houses.

——	Total number.	Number paved and drained.	Number unpaved.
1917	—	—	—
1918	—	—	—
1919	—	—	—

8. Latrines.

——	For Males.		For Females	
	Number.	Number of seats.	Number.	Number of seats.
Number of Public Latrines:—				
1917	5	5	1	1
1918	3	3	—	—
1919	3	2	1	—
Number of new Public Latrines erected during the year:—				
1917	—	—	—	—
1918	1	—	—	—
1919	1	—	1	—
Number of Public Latrines repaired during the year:—				
1917	Nil	Nil	Nil	Nil
1918	,,	,,	,,	,,
1919	,,	,,	,,	,,
Number of Public Latrines demolished during the year:—				
1917	,,	,,	,,	,,
1918	,,	,,	,,	,,
1919	1	,,	,,	,,

——	1917	1918	1919
Number of Private Latrines	27	26	35
Average number of pails of nightsoil removed daily ...	27	29	35
Average number of soiled pails removed and clean pails substituted	27	—	—
Number of nightsoil men employed to clean latrines and remove excreta	4	2	*2
Number of cesspools	Nil	Nil	Nil
Number of cesspools cleansed	,,	,,	,,
Number of new cesspools constructed during the year ...	—	—	—
Number of old cesspools abolished	,,	,,	,,
Number of cesspools oiled regularly by Department ...	,,	,,	,,

9. Removal of Refuse.

——	1917	1918	1919
Number of dustbins	20	25	26
Number of carts at work daily to remove refuse from streets	—	—	—
Amount of refuse removed daily	—	—	—
Number of carts at work daily to remove refuse from yards and premises...	—	15	—
Amount of refuse removed daily from yards and premises	—	2	2
Number of men employed for moving refuse	2		

* And Prisoners.

10. Mode of Disposal of Excreta, Refuse and Offal.

	Daily average number of pails of excreta.			Daily average number of cartloads of refuse			Daily average number of cartloads of Slaughter House and Market Offal.		
	1917	1918	1919	1917	1918	1919	1917	1918	1919
Buried or trenched	12	29	35	Nil	15	Nil	Nil	Nil	Nil
Burnt	—	—	—	,,	—	,,	,,	,,	,,
Thrown into sea	—	—	—	,,	—	,,	,,	,,	,,
Otherwise dealt with	—	—	—	,,	—	,,	,,	,,	,,

State mode of disposal.

11. Average Daily Number of Cartloads of Tin Cans, Bottles, Broken Crockery, and other Incombustible Material Removed from Houses, Huts and Compounds.

1917	1918	1919
—	—	—

12. Water Supply.

Nature of Water Supply.	1917	1918	1919
Pipe-borne water :—			
Source (river, lake, or spring) :—	Nil	Nil	Nil
Number of linear yards	Direct from river.		
Number of stand-pipes along roads	—	—	—
Number of stand-pipes in compounds and houses ...	—	—	—
Wells :—			
Public :—			
Number	Nil	Nil	Nil
Number with pumps protected against surface water and mosquito-protected	,,	,,	,,
Private :—			
Number	,,	,,	,,
Number protected against surface water and mosquito-protected	3	3	3
Tanks :—			
Public :—			
Number underground	—	—	—
Number mosquito-protected and served by pumps ...	—	—	—
Number above ground	—	—	—
Number mosquito-protected	—	1	1
Number of 400 gallons capacity or less	—	1	—
Number above 400 gallons	—	—	1
Private :—			
Number underground	—	—	—
Number mosquito-protected	—	—	—
Number above ground	—	3	—
Number mosquito-protected	—	1	5
Number of 400 gallons capacity or less	—	2	—
Number above 400 gallons	—	1	5

Nature of Water Supply.	1917	1918	1919
Nature of tanks :—			
Wood	—	—	—
Iron	3	3	6
Concrete	—	—	—
Barrels :—			
Number	1	1	—
Number mosquito-protected	—	—	—

13. Drainage.

Nature of Drainage.	Public.	Private.
Masonry drains :—		
Linear yards of masonry drains :—		
1917	783	—
1918	783	—
1919	—	—
Linear yards reconstructed during the year :—		
1917	40	
1918	40	—
1919	—	—
Linear yards repaired during the year :—		
1917	150	—
1918	150	—
1919	—	—
Linear yards of new drains constructed during the year :—		
1917	—	—
1918	—	—
1919	—	—
Earth drains or ditches :—		
Number of linear yards of ditches cleaned :—		
1917	2,920	—
1918	2,920	—
1919	4,246	—
Number of linear yards of ditches dug and graded :—		
1917	75	—
1918	75	—
1919	246	—
Average frequency of clearing ditches of grass :—		
1917	8	—
1918	8	—
1919	monthly.	—

14. Clearance of Undergrowth, Long Grass and Jungle.

—	1917	1918	1919
Number of square yards of weeds, grass, and vegetation cut and removed	As required.		
Average frequency of clearance of rank vegetation on same area	2	2	As required.

15. Excavations and Low-lying Land.

——	1917	1918	1919
Number of pools and excavations	41	41	—
Number of excavations filled up	4	—	Nil
Amount of low-lying and marsh land raised and drained ...	—	—	,,
Number of pools, marshes, streams, &c., fish-stocked ...	—	—	,,
Number of cubic yards of material used for filling up pools and excavations	—	—	,,
Number of persons fined for making new excavations ...	—	—	,,
Average number of men daily employed in filling up pools &c.	—	—	,,

16. Oiling.

——	1917	1918	1919
Number of drains oiled	Nil	Nil	Nil
Number of pools and excavations oiled	,,	,,	,,
Number of tanks and barrels oiled	,,	,,	,,
Average number of men daily employed for oiling drains, pools, and watertanks or barrels	,,	,,	,,

17. Inspections and Prosecutions.

——	1917	1918	1919
Number of inspectors employed	—	—	—
Number of houses inspected	—	—	—
Number of houses where larvae were found	—	—	—
Number of notices served to remove conditions causing the breeding of larvae	—	—	—
Number of persons fined for having mosquito larvae on premises	—	—	—
Number of notices served to remove insanitary conditions on premises	4	—	—
Number of persons fined for not removing insanitary conditions after notice	1	—	—
Number of soda and aerated water factories inspected ...	—	—	—

TABLE IV.

SUMMARY OF ROUTINE SANITARY WORK DONE DURING THE YEAR IN THE TOWN.

1. Name of Town—Blantyre.

	Approximate area.	Number of proclaimed open spaces.
1917	1,000 sq. yds.	2
1918	1 square mile.	2
1919	1 „ „	2

2. Population.

	Number of Asiatics.		Number of Europeans.		Total.
	Males.	Females.	Males.	Females.	
1917	—	—	29	14	43
1918	33	4	38	14	89
1919	40	6	40	15	101

3. Housing.

	Number occupied by Europeans.	Number occupied by Natives.
Number of Houses:—		
1917	23	—
1918 .. .	24	—
1919	26	—
Number of Huts:—		
1917 ...	—	300
191	—	260
1919	—	260

4. Mosquito Protection of Houses.

	1917	1918	1919
Number of European houses wholly mosquito-protected .	None	None	None
Number of European houses with mosquito room	1	1	„
Number rendered during the year wholly mosquito-protected	None	None	None
Number rendered during the year partially mosquito-protected	„	„	„

5. Erection of New Buildings during the Year.

	1917	1918	1919
Number of public buildings erected with sanction as to site, construction, and relation to other buildings	Nil	4	Nil
Number of houses erected with sanction as to site, construction, and relation to other buildings	1	Nil	3 garag es
Number of huts erected with sanction as to site, construction, and relation to other buildings	1	,,	1
Number of houses built without sanction	Nil	,,	Nil
Number of huts built without sanction ...	10	3	,,

Action Taken.

	Number of Prosecutions		Number demolished.	
	Huts.	Houses.	Huts.	Houses.
1917	—	—	—	—
1918	—	—	—	—
1919	—	—	—	—

6. Markets.

	Total number.	Number paved and drained.	Number unpaved.
1917	1	Nil	1
1918	1	,,	1
1919	1	,,	1

7. Slaughter-houses.

	Total number.	Number paved and drained.	Number unpaved.
1916	2	1	1 (unused).
1917	1	1	Nil
1918	2	2	,,

8. Latrines

	For Males.		For Females.	
	Number.	Number of seats.	Number.	Number of seats.
Number of Public Latrines :—				
1917	3	5	2	4
1918	3	5	2	4
1919	3	5	2	4
Number of new Public Latrines erected during the year :—				
1917	—	—	—	—
1918	—	—	—	—
1919	—	—	—	—
Number of Public Latrines repaired during the year :—				
1917	—	—	—	—
1918	—	—	—	—
1916	—	—	—	—
Number of Public Latrines demolished during the year :—				
1917	—	—	—	—
1918	—	—	—	—
1919	—	—	—	—

	1917	1918	1919
Number of Private Latrines	56	56	56
Average number of pails of nightsoil removed daily	56	56	56
Average number of soiled pails removed and clean pails substituted	56	56	56
Number of nightsoil men employed to clean latrines and remove excreta	12	12	10
Number of cesspools	—	—	—
Number of cesspools cleansed	—	—	—
Number of new cesspools constructed during the year ...	—	—	—
Number of old cesspools abolished	—	—	—
Number of cesspools oiled regularly by Department	—	—	—

9. Removal of Refuse.

	1917	1918	1919
Number of dustbins	10	10	10
Number of carts at work daily to remove refuse from streets	1	1	1
Amount of refuse removed daily	3	4	4 Cartloads
Number of carts at work daily to remove refuse from yards and premises	—	—	—
Amount of refuse removed daily from yards and premises ...	Not known.		
Number of men employed for moving refuse	8	8	8

10. Mode of Disposal of Excreta, Refuse, and Offal.

	Daily average number of pails of excreta.			Daily average number of cartloads of refuse.			Daily average number of cartloads of Slaughter House and Market Offal.		
	1917	1918	1919	1917	1918	1919	1917	1918	1919
Buried or trenched	67	65	72	—	—	—	Market offal included in cartloads of other refuse. Slaughter house offal removed by owners.		
Burnt	—	—	—	3	4	4			
Thrown into sea ...	—	—	—	—	—	—			
Otherwise dealt with ...	—	—	—	—	—	—			

State mode of disposal.

11. Average Daily Number of Cartloads of Tin Cans, Bottles, Broken Crockery and other Incombustible Material Removed from Houses, Huts, and Compounds.

1917	1918	1919
		Included in No. 10.

12. Water Supply.

Nature of Water Supply.	1917	1918	1919
Pipe-borne water :—			
Source (river, lake, or spring) :—			
Number of linear yards	—	—	—
Number of stand-pipes along roads	—	—	—
Number of stand-pipes in compounds and houses ...	—	—	—
Wells :—			
Public :—			
Number	2	2	2
Number with pumps protected against surface water and mosquito-protected	2	2	2
Private :—			
Number	4	4	4
Number protected against surface water and mosquito-protected	4	4	4
Tanks :—			
Public :—			
Number underground	—	—	—
Number mosquito-protected and served by pumps ...	—	—	—
Number above ground	—	—	—
Number mosquito-protected	—	—	—
Number of 400 gallons capacity or less	—	—	—
Number above 400 gallons	—	—	—
Private :—			
Number underground	—	—	—
Number mosquito-protected	—	—	—
Number above ground	18	18	18
Number mosquito-protected	5	5	5
Number of 400 gallons capacity or less	—	—	—
Number above 400 gallons	18	18	18

Nature of Water Supply.	1917	1918	1919
Nature of tanks :—			
Wood	—	—	—
Iron	18	18	18
Concrete	—	—	—
Barrels :—			
Number	—	—	—
Number mosquito-protected	—	—	—

13. Drainage.

Nature of Drainage.	Public.	Private.
Masonry drains :—		
Linear yards of masonry drains :—		
1917	3000	
1918	5000	
1919	5000	
Linear yards reconstructed during the year :—		
1917	—	
1918	—	
1919	—	Unknown.
Linear yards repaired during the year :—		
1917	—	
1918	—	
1919	—	
Linear yards of new drains constructed during the year :—		
1917	2000	
1918	—	
1919	100	
Earth drains or ditches :—		
Number of linear yards of ditches cleaned :—		
1917	—	
1918	All roadside drains.	
1919	—	
Number of linear yards of ditches dug and graded :—		
1917	—	
1918	—	
1919	—	
Average frequency of clearing ditches of grass :—		
1917	—	
1918	—	
1919	Three times yearly.	

14. Clearance of Undergrowth, Long Grass and Jungle.

	1917	1918	1919
Number of square yards of weeds, grass, and vegetation cut and removed	Not known.		
Average frequency of clearance of rank vegetation on same area	Three times yearly.		

15. Excavations and Low-lying Land.

—	1917	1918	1919
Number of pools and excavations	Pools filled in by occupiers when reported by Sanitary Inspector.		
Number of excavations filled up			
Amount of low-lying and marsh land raised and drained			
Number of pools, marshes, streams, &c., fish-stocked ...	—		—
Number of cubic yards of material used for filling up pools and excavations	—		—
	—	—	
Number of persons fined for making new excavations ...	—	—	—
Average number of men daily employed in filling up pools &c.	—	—	—

16. Oiling.

—	1917	1918	1919
Number of drains oiled	—	—	—
Number of pools and excavations oiled ...	Oil not in use.		
Number of tanks and barrels oiled	—	—	—
Average number of men daily employed for oiling drains, pools, and watertanks or barrels	—	—	—

17 Inspections and Prosecutions.

—	1917	1918	1919
Number of inspectors employed	1	1	1
Number of houses inspected	—	No record.	
Number of houses where larvae were found	1	5	Nil
Number of notices served to remove conditions causing the breeding of larvae	1	5	,,
Number of persons fined for having mosquito larvae on premises	Nil	Nil	,,
Number of notices served to remove insanitary conditions on premises	56	65	43
Number of persons fined for not removing insanitary conditions after notice	1	8	5
Number of soda and aerated water factories inspected ...	1	1	Nil

TABLE IV.

SUMMARY OF ROUTINE SANITARY WORK DONE DURING THE YEAR IN THE TOWN.

1. Name of Town—Zomba.

—	Approximate area.	Number of proclaimed open spaces.
1917	688	
1918	688	
1919	688	

2. Population.

—	Number of Asiatics.		Number of Europeans.		Total.
	Males.	Females.	Males.	Females.	
1917	320	115	56	24	515
1918	320	115	56	24	515
1919	504	150	117	38	809

3. Housing.

—	Number occupied by Europeans.	Number occupied by Asiatics.
Number of Houses:—		
1917	70	60 personal boy quarters.
1918	70	60 „ „ „
1919	73	73 „ „ „
Number of Huts:—		
1917	Nil except personal servants quarters.	
1918	—	—
1919	—	—

4. Mosquito Protection of Houses.

—	1917	1918	1919
Number of European houses wholly mosquito-protected ...			
Number of European houses with mosquito room			
Number rendered during the year wholly mosquito-protected	Nil.		
Number rendered during the year partially mosquito-protected			

5. Erection of New Buildings during the Year.

	1917	1918	1919
Number of public buildings erected with sanction as to site, construction, and relation to other buildings	Nil	Nil	Nil
Number of houses erected with sanction as to site, construction, and relation to other buildings	,,	,,	3
Number of huts erected with sanction as to site, construction, and relation to other buildings	,,	,,	Nil
Number of houses built without sanction	,,	,,	,,
Number of huts built without sanction	,,	,,	,,

Action Taken.

	Number of Prosecutions		Number demolished.	
	Huts.	Houses.	Huts.	Houses.
1917	Nil	Nil	Nil	Nil
1918	,,	,,	,,	,,
1919	,,	,,	,,	,,

6. Markets.

	Total number.	Number paved and drained.	Number unpaved.
1917	1	—	1
1918	1	—	1
1919	1	—	1

7. Slaughter-houses.

	Total number.	Number paved and drained.	Number unpaved.
1917	1	1	—
1918	1	1	—
1919	1	1	—

8. Latrines.

	For Males.		For Females.	
	Number.	Number of seats.	Number.	Number of seats.
Number of Public Latrines :—				
1917	5	26	3	15
1918	5	26	3	15
1919	3	18	3	12
Number of new Public Latrines erected during the year :—				
1917	—	—	—	—
1918	—	—	—	—
1919	—	—	—	—
Number of Public Latrines repaired during the year :—				
1917	Nil	Nil	Nil	Nil
1918	,,	,,	,,	,,
1919	,,	,,	,,	,,
Number of Public Latrines demolished during the year:—				
1917	,,	,,	,,	,,
1918	,,	,,	,,	,,
1919	,,	,,	,,	,,

	1917	1918	1919
Number of Private Latrines	64	64	73
Average number of pails of nightsoil removed daily ...	64	64	73
Average number of soiled pails removed and clean pails substituted	64	64	73
Number of nightsoil men employed to clean latrines and remove excreta	Unknown; private labour.		
Number of cesspools	—	—	*8
Number of cesspools cleansed	—	—	—
Number of new cesspools constructed during the year ...	—	—	—
Number of old cesspools abolished	—	—	—
Number of cesspools oiled regularly by Department ...	—	—	—

9. Removal of Refuse.

	1917	1918	1919
Number of dustbins	30	30	105
Number of carts at work daily to remove refuse from streets			
Amount of refuse removed daily	Nil	Nil	Nil
Number of carts at work daily to remove refuse from yards and premises	,,	,,	,,
Amount of refuse removed daily from yards and premises ...	Unknown; Private labour.		
Number of men employed for moving refuse	,,	,,	,,

*French Latrines

10. Mode of Disposal of Excreta, Refuse and Offal.

	Daily average number of pails of excreta.			Daily average number of cartloads of refuse			Daily average number of cartloads of Slaughter House and Market Offal.		
	1917	1918	1919	1917	1918	1919	1917	1918	1919
Buried or trenched	63	64	64	—	—	—	—	—	—
Burnt	Nil	Nil	Nil	—	—	—	—	—	—
Thrown into sea	,,	,,	,,	—	—	—	—	—	—
Otherwise dealt with	,,	,,	,,	—	—	—	—	—	—

State mode of disposal.

11. Average Daily Number of Cartloads of Tin Cans, Bottles, Broken Crockery, and other Incombustible Material Removed from Houses, Huts and Compounds.

1917	1918	1919
—	—	—

12. Water Supply.

Nature of Water Supply.	1917	1918	1919
Pipe-borne water :—			
Source (river, lake, or spring) :—			
Number of linear yards	—	—	—
Number of stand-pipes along roads	Water supply from		
Number of stand-pipes in compounds and houses ...	mountain stream.		
Wells :—			
Public :—			
Number	—	—	—
Number with pumps protected against surface water and mosquito-protected	—	—	—
Private :—			
Number	—	—	—
Number protected against surface water and mosquito-protected	—	—	—
Tanks :—			
Public :—			
Number underground	—	—	—
Number mosquito-protected and served by pumps ...	—	—	—
Number above ground	—	—	—
Number mosquito-protected	—	—	—
Number of 400 gallons capacity or less	—	—	—
Number above 400 gallons	—	—	—
Private :—			
Number underground	—	—	—
Number mosquito-protected	—	—	—
Number above ground	—	—	—
Number mosquito-protected	—	—	—
Number of 400 gallons capacity or less	—	—	—
Number above 400 gallons	—	—	—

Nature of Water Supply.	1917	1918	1919
Nature of tanks :—			
Wood	Nil	Nil	Nil
Iron	1	—	1
Concrete	—	—	—
Barrels :—			
Number			
Number mosquito-protected			

13. Drainage.

Nature of Drainage.	Public.	Private.
Masonry drains :—		
Linear yards of masonry drains :—		
1917	Nil	Nil
1918	,,	,,
1919	,,	,,
Linear yards reconstructed during the year :—		
1917	,,	
1918	,,	,,
1919	,,	,,
Linear yards repaired during the year :—		
1917	,,	,,
1918	,,	,,
1919	,,	,,
Linear yards of new drains constructed during the year :—		
1917	,,	,,
1918	,,	,,
1919	,,	,,
Earth drains or ditches :—		
Number of linear yards of ditches cleaned :—		
1917	Unknown	Unknown.
1918	,,	,,
1919	,,	,,
Number of linear yards of ditches dug and graded :—		
1917	,,	,,
1918	,,	,,
1919	,,	,,
Average frequency of clearing ditches of grass :—		
1917	Periodically.	
1918	,,	
1919	,,	

14. Clearance of Undergrowth, Long Grass and Jungle.

	1917	1918	1919
Number of square yards of weeds, grass, and vegetation cut and removed	Unknown.		
Average frequency of clearance of rank vegetation on same area	About once a year.		

15. Excavations and Low-lying Land.

	1917	1918	1919
Number of pools and excavations	5	—	—
Number of excavations filled up	8	—	—
Amount of low-lying and marsh land raised and drained	None	—	—
Number of pools, marshes, streams, &c., fish-stocked	—	—	—
Number of cubic yards of material used for filling up pools and excavations	—	—	—
Number of persons fined for making new excavations	—	—	—
Average number of men daily employed in filling up pools &c.	—	—	—

16. Oiling.

	1917	1918	1919
Number of drains oiled	Nil	Nil	Nil
Number of pools and excavations oiled	,,	,,	,,
Number of tanks and barrels oiled	,,	,,	,,
Average number of men daily employed for oiling drains, pools, and watertanks or barrels	,,	,,	,,

17. Inspections and Prosecutions.

	1917	1918	1919
Number of inspectors employed	1	1	1
Number of houses inspected	67	67	60
Number of houses where larvae were found	8	—	30
Number of notices served to remove conditions causing the breeding of larvae	Nil	Nil	Nil
Number of persons fined for having mosquito larvae on premises	46	—	105
Number of notices served to remove insanitary conditions on premises	Nil	Nil	Nil
Number of persons fined for not removing insanitary conditions after notice	,,	,,	,,
Number of soda and aerated water factories inspected	,,	,,	,,

TABLE IV.

SUMMARY OF ROUTINE SANITARY WORK DONE DURING THE YEAR IN THE TOWN.

1. Name of Town—Fort Johnston.

—	Approximate area.	Number of proclaimed open spaces.
1917	72 acres.	Nil
1918	72 „	„
1919	72 „	„

2. Population.

—	Number of Asiatics.		Number of Europeans.		Total.
	Males.	Females.	Males.	Females.	
1917	—	—	—	—	—
1918	—	—	—	—	—
1919	—	—	11	2	13

3. Housing.

—	Number occupied by Europeans.	Number occupied by Natives.
Number of Houses:—		
1917	—	—
1918	—	—
1919 ...	9	—
Number of Huts:—		
1917 ...	—	—
191	—	—
1919	—	—

Also 10 occupied by Asiatics.

4. Mosquito Protection of Houses.

—	1917	1918	1919
Number of European houses wholly mosquito-protected ...	—	—	—
Number of Europea houses with mosquito room	—	—	5
Number rendered during the year wholly mosquito-protected	—	—	—
Number rendered during the year partially mosquito-protected	—	—	1

5. Erection of New Buildings during the Year.

—	1917	1918	1919
Number of public buildings erected with sanction as to site, construction, and relation to other buildings	—	—	1
Number of houses erected with sanction as to site, construction, and relation to other buildings	—	—	—
Number of huts erected with sanction as to site, construction, and relation to other buildings	—	—	—
Number of houses built without sanction	—	—	—
Number of huts built without sanction ...	—	—	—

Action Taken.

—	Number of Prosecutions		Number demolished.	
	Huts.	Houses.	Huts.	Houses.
1917	—	—	—	—
1918	—	—	—	—
1919	—	—	*53	3

* mostly old military camps.

6. Markets.

—	Total number.	Number paved and drained.	Number unpaved.
1917	—	—	—
1918	—	—	—
1919	—	—	—

7. Slaughter-houses.

—	Total number.	Number paved and drained.	Number unpaved.
1917	—	—	—
1918	—	—	—
1919	—	—	—

8. Latrines.

	For Males.		For Females.	
	Number.	Number of seats.	Number.	Number of seats.
Number of Public Latrines:—				
1917	—	—	—	—
1918	—	—	—	—
1919	4	—	3	—
Number of new Public Latrines erected during the year:—				
1917	—	—	—	—
1918	—	—	—	—
1919	—	—	—	—
Number of Public Latrines repaired during the year:—				
1917	—	—	—	—
1918	—	—	—	—
1919	4	—	3	—
Number of Public Latrines demolished during the year:—				
1917	—	—	—	—
1918	—	—	—	—
1919	—	—	—	—

	1917	1918	1919
Number of Private Latrines	—	—	19
Average number of pails of nightsoil removed daily ...	—	—	5
Average number of soiled pails removed and clean pails substituted	—	—	21
Number of nightsoil men employed to clean latrines and remove excreta	—	—	4
Number of cesspools	—	—	—
Number of cesspools cleansed	—	—	—
Number of new cesspools constructed during the year ...	—	—	—
Number of old cesspools abolished	—	—	—
Number of cesspools oiled regularly by Department ...	—	—	—

9. Removal of Refuse.

	1917	1918	1919
Number of dustbins	—	—	21
Number of carts at work daily to remove refuse from streets	—	—	—
Amount of refuse removed daily	—	—	10 pails.
Number of carts at work daily to remove refuse from yards and premises...	—	—	—
Amount of refuse removed daily from yards and premises	—	—	—
Number of men employed for moving refuse	—	—	4

10. Mode of Disposal of Excreta, Refuse, and Offal.

	Daily average number of pails of excreta.			Daily average number of cartloads of refuse.			Daily average number of cartloads of Slaughter House and Market Offal.		
	1917	1918	1919	1917	1918	1919	1917	1918	1919
Buried or trenched ...	—	—	5	—	—	10	—	—	—
Burnt	—	—	—	—	—	—	—	—	—
Thrown into sea ...	—	—	—	—	—	—	—	—	—
Otherwise dealt with ...	—	—	—	—	—	—	—	—	—

State mode of disposal.

11. Average Daily Number of Cartloads of Tin Cans, Bottles, Broken Crockery and other Incombustible Material Removed from Houses, Huts, and Compounds.

1917	1918	1919
—	—	2 pails.

12. Water Supply.

Nature of Water Supply.	1917	1918	1919
Pipe-borne water :—			
Source (river, lake, or spring) :—			
Number of linear yards	—	—	—
Number of stand-pipes along roads	—	—	—
Number of stand-pipes in compounds and houses ...	—	—	—
Wells :—			
Public :—			
Number	—	—	—
Number with pumps protected against surface water and mosquito-protected	—	—	—
Private :—			
Number	—	—	2
Number protected against surface water and mosquito-protected	—	—	2
Tanks :—			
Public :—			
Number underground	—	—	—
Number mosquito-protected and served by pumps ...	—	—	—
Number above ground	—	—	—
Number mosquito-protected	—	—	—
Number of 400 gallons capacity or less	—	—	—
Number above 400 gallons	—	—	—
Private :—			
Number underground	—	—	—
Number mosquito-protected	—	—	—
Number above ground	—	—	2
Number mosquito-protected	—	—	2
Number of 400 gallons capacity or less	—	—	2
Number above 400 gallons	—	—	—

Nature of Water Supply.	1917	1918	1919
Nature of tanks :—			
Wood	—	—	—
Iron	—	—	2
Concrete	—	—	—
Barrels :—			
Number	—	—	—
Number mosquito-protected	—	—	—

13. Drainage.

Nature of Drainage.	Public.	Private.
Masonry drains :—		
Linear yards of masonry drains :—		
1917	—	—
1918	—	—
1919	820	—
Linear yards reconstructed during the year :—		
1917	—	—
1918	—	—
1919	35	—
Linear yards repaired during the year :—		
1917	—	—
1918	—	—
1919	20	—
Linear yards of new drains constructed during the year :—		—
1917	—	—
1918	—	—
1919	30	—
Earth drains or ditches :—		
Number of linear yards of ditches cleaned :—		
1917	—	—
1918	—	—
1919	—	—
Number of linear yards of ditches dug and graded :—		
1917	—	—
1918	—	—
1919	—	—
Average frequency of clearing ditches of grass :—		
1917	—	—
1918	—	—
1919	—	—

14. Clearance of Undergrowth, Long Grass and Jungle.

	1917	1918	1919
Number of square yards of weeds, grass, and vegetation cut and removed	—	—	15,000
Average frequency of clearance of rank vegetation on same area	—	—	One per annum.

15. Excavations and Low-lying Land.

——	1917	1918	1919
Number of pools and excavations	—	—	—
Number of excavations filled up	—	—	3
Amount of low-lying and marsh land raised and drained	—	—	—
Number of pools, marshes, streams, &c., fish-stocked ...	—	—	—
Number of cubic yards of material used for filling up pools and excavations	—	—	
Number of persons fined for making new excavations ...	—	—	—
Average number of men daily employed in filling up pools &c.	—	—	2

16. Oiling.

——	1917	1918	1919
Number of drains oiled	—	—	—
Number of pools and excavations oiled	—	—	—
Number of tanks and barrels oiled	—	—	—
Average number of men daily employed for oiling drains, pools, and watertanks or barrels	—	—	—

17 Inspections and Prosecutions.

——	1917	1918	1919
Number of inspectors employed	—	—	1
Number of houses inspected	—	—	14
Number of houses where larvae were found	—	—	2
Number of notices served to remove conditions causing the breeding of larvae	—		2
Number of persons fined for having mosquito larvae on premises	—	—	—
Number of notices served to remove insanitary conditions on premises	—	—	2
Number of persons fined for not removing insanitary conditions after notice	—	—	—
Number of soda and aerated water factories inspected ...	—	—	—

SECTION V.

HOSPITALS AND DISPENSARIES.

The total of hospital accommodation in Government Hospitals is as follows:—

Europeans.	Natives.
32 beds	about 100 beds (excluding troops)

Diseases Treated.

These have already been referred to under Public Health, and are shewn in extenso in annexed Tables.

TABLE VI.

RETURN OF DISEASES (IN-PATIENTS) FOR THE YEAR 1919.

Diseases.	*In Hospital at end of 1918.	Yearly Total.		†Total Cases Treated.	‡In Hospital at end of 1919.
		Admissions.	Deaths.		
Infective Diseases.					
Cerebro-Spinal Fever	—	1	1	1	—
Chicken-pox	—	16	—	16	—
Dysentery	3	70	17	73	—
Enteric	—	1	—	1	—
Paratyphoid	—	4	1	4	—
Erysipelas	—	2	—	2	—
Gonorrhœa	2	62	—	64	—
Influenza	6	107	15	113	—
Leprosy (*a*) Nodular	—	1	—	1	—
(*b*) Anæsthetic	—	3	—	3	—
Malaria (*a*) Tertian	—	53	2	53	—
(*b*) Aestivo-autumnal	—	34	—	34	—
(*c*) Black-water	—	5	1	5	—
Measles	—	2	—	2	—
Pneumonia	—	42	16	42	1
Relapsing Fever	—	8	—	8	1
Mumps	—	2	—	2	—
Rheumatic Fever	—	4	—	4	—
Septicæmia	—	1	1	1	—
Trypanosomiasis (Sleeping Sickness) ...	—	1	1	1	—
Syphilis (*a*) Primary	—	88	—	88	—
(*b*) Secondary	4	28	—	32	2
(*c*) Inherited	—	2	—	2	—
Tuberculosis	1	15	5	16	—
Yaws	—	5	—	5	—
Pyrexia	—	18	—	18	—
Intoxications.					
Pellagra	—	1	—	1	—
General Diseases			—		—
Anæmia—Pernicious	2	7	1	9	—
Total	18	583	61	601	4

The form shows in the main the arrangement of disease in the nomenclature of the Royal College of Physicians, 1906 Edition. To save space, the unimportant diseases of any class can be grouped in their places as "Other Diseases" of the class.

* *i.e.*, the year previous to that for which the Return is made.

† "Total cases treated" will, of course, include those remaining in Hospital at the end of the previous year.

‡ The figures in this column to be carried on to the next year's Return.

TABLE VI.—IN-PATIENTS—*Continued.*

RETURN OF DISEASES AND DEATHS (IN-PATIENTS) FOR THE YEAR 1919.

Diseases.	In Hospital at end of 1918.	Yearly Total.		Total Cases Treated.	In Hospital at end of 1919.
		Admissions.	Deaths.		
Brought forward	18	583	61	601	4
LOCAL DISEASES.					
Diseases of the Nervous System—	—	1	1	1	—
Abscess of Brain	—	11	—	11	—
Myalgia					
Apoplexy ...	—	1	—	1	—
Paralysis	—	2	—	2	—
Epilepsy	—	1	—	1	—
Neuralgia	1	6	—	7	—
Hysteria	—	1	—	1	—
Disseminated Selerosis	—	1	1	1	—
Insomnia	—	1	—	1	—
Neurasthenia	—	1	—	1	—
Mental Diseases—					
Delusional Insanity	—	2	—	2	—
Diseases of the Eye—					
Conjunctivitis	—	8	—	8	
Keratitis	—	1	—	1	—
Ulceration of Cornea	—	1	—	1	—
Iritis	—	1	—	1	—
Diseases of the Ear—					
Inflammation	2	—	—	2	—
Other Diseases	—	1	—	1	—
Diseases of the Nose—					
Catarrh	—	4	—	4	—
Diseases of the Circulatory System—			—		
Endocarditis	—	1	—	1	—
Valvular Mitral	—	3	2	3	—
Aortic ...	—	1	1	1	—
Diseases of the Respiratory System—					
Bronchitis	3	64	2	67	1
Asthma	—	1	—	1	—
Broncho-pneumonia	—	1	1	1	—
Pleurisy	—	4	—	4	—
Empyema	—	1	—	1	—
Diseases of the Digestive System—					
Sore Throat	—	1	—	1	—
Inflammation of Tonsils	—	4	—	4	—
Gastritis	—	1	—	1	—
Dyspepsia	—	2	—	2	—
Enteritis	—	2	—	2	—
Colitis	—	5	—	5	—
Hernia	—	4	1	4	1
Diarrhœa	5	30	2	35	—
Colic Biliary	—	1	—	1	—
Pharyngitis	—	1	—	1	—
Hepatitis—Acute ...	—	3	—	3	—
Abscess	—	12	—	12	1
Cirrhosis	—	1	—	1	—
Jaundice	1	1	—	2	—
Carried forward	30	771	72	801	7

TABLE VI.—IN-PATIENTS.—*Continued.*

RETURN OF DISEASES AND DEATHS (IN-PATIENTS) FOR THE YEAR 1919.

Diseases.	In Hospital at end of 1918.	Yearly Total.		Total Cases Treated.	In Hospital at end of 1919.
		Admissions.	Deaths.		
Brought forward	30	771	72	801	7
LOCAL DISEASES.					
Diseases of the Lymphatic System—					
Splenitis	—	1	—	1	1
Inflammation of Lymphatic Gland ..	—	2	—	2	—
Diseases of the Urinary System—					
Acute Nephritis	—	1	—	1	—
Cystitis	—	3	—	3	—
Hæmaturia	—	11	—	11	—
Diseases of the Generative System—					
Male Organs—					
Soft Chancre	—	2	—	2	—
Balanitis	—	1	—	1	—
Female Organs—					
Displacement of Uterus	—	3	—	3	—
Leucorrhœa	—	1	—	1	—
Delayed Labour	—	2	—	2	—
Parturition	—	7	3	7	—
Diseases of the Organs of Locomotion—					
Osteitis	—	1	—	1	—
Arthritis	—	1	—	1	—
Synovitis	—	2	—	2	—
Diseases of Connective Tissue—					—
Cellulitis	—	44	—	44	—
Abscess	—	8	—	8	—
Ingrowing Nail	—	1	—	1	—
Diseases of the skin—					
Eczema	—	3	—	3	—
Boil	—	1	—	1	—
Herpes	—	1	—	1	—
Scabies	—	2	—	2	—
Ulcers	3	52	—	55	5
Burns	—	5	2	5	—
Injuries—General	—	42	4	42	1
Gunshot Wound	—	16	—	16	—
Local	2	34	1	36	1
Surgical Operations	—	19	—	19	—
Tumours	—	6	—	6	—
Malformations	—	1	—	1	—
Snake bite	—	2	—	2	—
Parasites—Animal					
Bilharziasis	—	1	—	1	—
Cestoda—					
Tænia Solium	—	1	—	1	—
Nematoda—					
Ascaris	—	2	—	2	—
Schistosoma	—	3	—	3	—
Ankylostomiasis	—	83	2	83	—
Insecta—					
Jiggers	—	1	—	1	—
Total	35	1,137	84	1,172	15

TABLE VII.

RETURN OF DISEASES AND DEATHS (OUT-PATIENTS) FOR THE YEAR 1919.

Diseases.	Male.	Female.
Infective Diseases.		
Chicken-pox	2	—
Dysentery	184	20
Enteric	3	—
Paratyphoid	1	—
Erysipelas	2	—
Gonorrhœa	33	1
Influenza	169	2
Malaria (*a*) Tertian	18	—
(*b*) Aestivo-autumnal	168	14
(*c*) Chronic Malaria	12	—
(*d*) Black-water	1	—
Pneumonia	6	—
Rheumatic Fever	2	—
Syphilis (*a*) Primary	29	9
(*b*) Secondary	32	7
(*c*) Inherited	6	—
Tuberculosis	8	—
Whooping Cough	4	1
Yaws	4	5
Pyrexia	192	9
Vaccinia	15	—
Intoxications.		
Alcoholism	8	—
Malingerers	7	—
Exhaustion	1	—
General Diseases.		
Anæmia—Pernicious	8	—
Debility	4	—
Rheumatism	91	2
Lumbago	39	—
Sciatica	3	—
Neuritis	3	—
Local Diseases.		
Diseases of the Nervous System—		
Neurosis	1	—
Paralysis	2	—
Chorea	—	1
Neuralgia	135	6
Hysteria	1	1
Neurasthenia	8	2
Headache	33	—
Insomnia	2	—
Paranoia	1	—
Mental Diseases—		—
Melancholia	2	—
Dementia	5	—
Delusional Insanity	8	3
Carried forward	1,253	83

TABLE VII.—OUT-PATIENTS.—*Continued.*

RETURN OF DISEASES (OUT-PATIENTS) FOR THE YEAR 1919.

Diseases.	Male.	Female.
Brought forward	1,253	83
LOCAL DISEASES—*Continued.*		
Diseases of the Eye—		
Conjunctivitis	74	15
Keratitis	1	—
Ulceration of Cornea	4	—
Iritis	3	1
Foreign body	2	—
Black eye	—	1
Other Diseases	2	—
Diseseas of the Ear—		
Inflammation	50	22
Other Diseases	22	2
Catarrh	2	—
Diseases of the Nose :—	4	—
Coryza	7	—
Rhinitis	2	—
Sasal Catarrh	7	—
Diseases of the Circulatory System—		
Endocarditis	1	—
Valvular Mitral	5	2
Aortic	3	—
Arterial Sclerosis	1	—
Functional Cardiac	1	—
Other Diseases	3	2
Diseases of the Respiratory System—		
Laryngitis	3	—
Bronchitis	340	28
Asthma	5	—
Bronco-pneumonia	1	—
Emphysema	1	—
Pleurisy	9	1
Empyema	2	—
Pleurodynia	11	—
Diseases of the Digestive System—		
Stomatitis	29	—
Caries of teeth	127	48
Sore Throat	52	9
Inflammation of Tonsils	12	—
Gastritis	4	—
Ulceration of Stomach	2	—
Hæmatemesis	2	—
Pharyngitis	3	—
Pausea	1	—
Dyspepsia	127	5
Enteritis	8	—
Appendicitis	1	—
Colitis	8	—
Ulceration of Intestines ...	1	—
Hernia	1	—
Diarrhœa	268	27
Constipation	254	20
Total	2,719	266

TABLE VII.—OUT-PATIENTS.—*Continued.*

RETURN OF DISEASES AND DEATHS (IN-PATIENTS) FOR THE YEAR 1919.

Diseases.	Male.	Female.
Brought forward	2,719	266
LOCAL DISEASES.—*Continued.*		
Diseases of the Digestive System—		
Colic	35	1
Hæmorrhoids	4	—
Hepatitis—Acute	4	—
Abscess	3	—
Jaundice	4	—
Diseases of the Lymphatic System—		
Splenitis	1	—
Inflammation of Lymphatic Gland	10	—
Suppuration of Lymphatic Gland	3	1
Lymphangitis	5	—
Elephantiasis	1	—
Diseases of the Urinary System—		
Bright's Disease	2	—
Renal Colic	1	—
Cystitis	1	—
Vesical Calculus	1	—
Hæmaturia	4	—
Dropsy	3	—
Enuresis	1	—
Diseases of the Generative System—		
Male Organs:—		
Urethritis	1	—
Gleet	6	—
Stricture	1	—
Prostatitis	1	—
Soft chancre	9	2
Inflammation of Scrotum	1	—
Hydrocele	3	—
Orchitis	1	—
Empididymitis	1	—
Phimosis	1	—
Female Organs:—		
Ovarian Cyst	—	1
Vaginitis	—	1
Amenorrhœa	—	1
Dysmenorrhœa	—	1
Abortion	—	3
Mastitis	—	2
Abscess of Breast	—	1
Diseases of the Organs of Locomotion—		
Osteitis	10	3
Arthritis	22	2
Synovitis	9	1
Whitlow	3	—
Myalgia	20	1
Orther Diseases	2	—
Total	2,893	287

TABLE VII.—OUT-PATIENTS.—*Continued.*

RETURN OF DISEASES (OUT-PATIENTS) FOR THE YEAR 1919.

Diseases.	Female.	Male.
Brought forward	2,893	287
LOCAL DISEASES—*Continued.*		
Diseases of Connective Tissue—		
Cellulitis	16	1
Abscess	40	7
Fibrositis	10	—
Oedema	2	—
Diseases of the Skin—		
Urticaria	15	—
Eczema	34	4
Boil	40	—
Carbuncle	2	—
Herpes	8	—
Psoriasis	1	—
Folliculitis	1	—
Prurigo	1	—
Tinea	18	1
Scabies	159	65
Acne	1	—
Dermatitis	5	—
Ulcers	1,176	137
Impetigo	8	—
Pruritus	18	—
Contusion	1	—
		—
INJURIES.		
Injuries—General	1	
Wound	362	9
Local	384	31
Surgical Operations	7	—
Confinement	—	1
Tumours	7	1
Malformations	3	—
Poisons	1	—
Snake bite	3	—
Parasites—Animal	3	3
Bilharziasis	5	—
Trematoda (Flukes)	4	—
Cestoda—		
Tænia Solium	1	—
Tænia Saginata	1	1
Nematoda—		
Ascaris	1	1
Schistosoma	2	—
Filariasis	6	2
Lamblia	1	—
Ankylostomiasis	3	—
Insecta—		
Insect bite	1	—
Myiasis	1	—
Jiggers	3	2
Total	5,249	553

Suggestions. If the European population of Nyasaland increases in the future in the same proportion as it has during the last 2 years, further provision will be required for

(*a*) General hospital accommodations for Europeans.

(*b*) A maternity hospital or home.

(*c*) Treatment of native labourers on estates; this is a point that even now requires consideration.

On many estates the planter endeavours to give such treatment as he can to his labourers, but in the absence of properly trained native hospital assistants, working under medical supervision, and with no facilities on the estates for hospital accommodation, little can be done; for the long distance many estates are from stations with a Medical Officer renders it impossible to send cases in for treatment.

A suitable scheme for the future might be for the planters to build and equip small hospitals and dispensaries in certain centres, and these hospitals to be regularly inspected by a Government Medical Officer. A trained native assistant would be required at each.

With the increased provison for Medical Officers for next year the staff in 1920-21 will consist, if all vacancies are filled, of the Principal Medical Officer, and 14 Medical Officers (including a Senior Medical Officer and a Sanitary Officer).

This will permit Medical Officers being stationed in several districts that for years have been without one, but if any really satisfactory work is to be done in connection with investigating and *treating* native diseases, and imparting some elementary instruction in hygiene, etc., to the native, several things are essential; increase in the staff of Sub-Assistant Surgeons and the establishment of a small training centre at headquarters for the instruction and training of a *permanent* staff of native assistants who would be competent to take charge of small outlying dispensaries.

Properly equipped native hospitals with accommodation for at least 14 or 20 cases are required in all outstations where a Medical Officer is regularly stationed. The reasons for increasing the staff of Sub-Assistant Surgeons has been pointed out in previous reports (V 1913 and others).

The need for a Dental Surgeon has previously been alluded to.

APPENDIX.

Sleeping Sickness.—Marimba.

Karonga,
7th October, 1919.

Sir,

I now have the honour to submit a report on the journey undertaken between 3rd and 17th September in the Marimba District from Kota-Kota to the Duangwa, through the villages more or less adjacent to the Lake, for the purpose of ascertaining if there are still cases of sleeping sickness thereabouts. The time at my disposal did not permit of any more extended search.

The villages there fall into two roughly parallel lines, those along the shore and those from two to six miles inland at the edge of the fly area, the latter being those in which, according to a list kindly furnished to me by the Resident at Kota-Kota, cases had chiefly occurred, between 1912 and 1914. All the inland villages—Chiboko, Msusa, Sawasawa, Bwanganda, Selemanis, Zombwe, Mboto, Kampange, Cheucheu, Amuli, Mangwalala, Lunda, Katimbira, Kapiunga, Mvula, Boys, Chiwala, Chinemba, Chuja, and Chiusa—were visited personally. Enquiry was made as to sickness of any kind; careful examination was made of all who were induced to come forward, or of whom news was afforded; a few blood films were taken; and a variety of petty ailments were treated with a view to obtaining the confidence of the people. But no cases presenting the clinical features of Trypanosomiasis were detected, nor has the subsequent examination of eight blood films proved positive.

The Lake side villages—Jumani, Mboto, Chetela, Kafita, Nkwenengwe, Mchambwe, Thom, Mbaraku, Chidoko, Kapeta, Chaluso, Gwere, Kandawire, Kambola, Chilawa, Chibangembe, Khochi, Kasinjani, Mpara—were visited by a native vaccinator whose services were lent me by the Resident. A few sick of whom he obtained news were seen by me personally and treated, but again no evidence of Trypanosomiasis was obtained.

2. In the village of Lunda's was a single sickly pariah dog; in the village of Bois a single wretched goat, the only domestic animals seen in the villages well within the fly area. Microscopic examination of the blood of both these animals shows abundant Trypanosomes. If the Bruce Commission is correct in its conclusion that the organism producing Nagana in domestic animals and sleeping sickness in man, are identical, the presence of such infected animals in a village may explain how it is that where one case has occurred in a village others crop up, adjacent villages remaining free. In this connection the history of the former little settlement of Chipata, originally with four huts not far from the Duangwa, is of interest. The record shows that between 1912 and 1914 two persons died there of sleeping sickness. I was told by the natives that two more had since died, having had similar symptoms, all four deaths being attributed by them to "the bad water of the Duangwa," and then the three survivors, a man and his two children, abandoned the settlement and moved to Chiusa where I saw and examined them. All three were however free from Trypanosomiasis, though the father and one boy showed very

definite evidence of syphilis. One wonders whether the history of Chipatas may not have been that of other villages which, as shown by fragments of pottery and by the groups of Euphorbiaceous trees which the natives were in the habit of planting round their burial places, formerly dotted within recent times at intervals for some miles from Lunda's onwards the high bank termed by the people Pandatote, now uninhabited.

3. *Tsetse flies.*—*Glossina morsitans* was first encountered at about six miles from Kota-Kota and thereafter became gradually more numerous, being most abundant at Lunda's, after leaving which one met fewer and fewer as the Duangwa was approached.

Glossina brevipalpis was found along the path wherever dense vegetation occurred, especially at the Bua and where sundry little streams now dry run across to the Lake. As showing how readily this fly may be unsuspected and undetected by reason of its crepuscular habits it may be remarked that on the northward journey I saw none, and it did not even occur to me to look for pupae. On the return journey I saw two in the early morning and on searching for pupae I found them abundantly. I thereupon set 19 men to search for them, under my capitao, while I was otherwise engaged, and they obtained no less than 13,838 empty puparia and 248 living pupae in four searches lasting about four or five hours each, and at dusk I was able to secure with a net as many of the flies as I wanted, 50 within twenty minutes.

I have the honour to be,

Sir,

Your obedient servant,

W. A. LAMBORN,

Medical Officer.